

REMARKS

Upon entry of this Amendment, claims 1-16 and 19-23 will be pending in the application. The limitation of dependent claim 17 has been incorporated into claim 1. Accordingly, claim 17 has been cancelled.

Rejection of Claims 1-17 and 19-23 Under 35 U.S.C. §103(a)

Applicants respectfully request reconsideration of the rejection of claims 1-17 and 19-23 under 35 U.S.C. §103(a) as obvious in view of the disclosure in U.S. Patent No. 6,936,727 to Sutton et al. (Sutton et al.).

Applicants note that U.S. Patent No. 6,936,727 B2 (issued August 30, 2005) and the publication of the underlying U.S. application as US 2004/0199026 A1 (published October 7, 2004) are not prior art with respect to the subject application under 35 U.S.C. §102(a) to the extent that the claimed subject matter is entitled to the December 16, 2003 priority date. Even though US 2004/0199026 A1 and U.S. Patent No. 6,936,727 may be prior art as to the subject application under 35 U.S.C. §102(e), since the subject application and U.S. Patent No. 6,936,727 are commonly assigned, neither of these references are available as prior art under §103 (See, 35 U.S.C. §103(c)). Applicants therefore assume that the Office's reliance on 35 U.S.C. §103(a) is based on International Publication No. WO 03/006446, corresponding to U.S. Patent No. 6,936,727 B2, which published January 23, 2003.

Independent claim 1 is directed to a process for the production of an ether optionally with a diol and/or a lactone, by reaction of a corresponding organic feed material selected from mono C₁ to C₄ alkyl esters of C₄ to C₁₂ unsaturated dicarboxylic acids and/or anhydrides, di-(C₁ to C₄) alkyl esters

of C₄ to C₁₂ unsaturated dicarboxylic acids and/or anhydrides, and/or lactones of C₄ to C₁₂ unsaturated hydroxycarboxylic acids.

As amended, the process of claim 1 includes, *inter alia*:

- (a) supplying a stream comprising at least a portion of an organic feed material to a pre-reactor zone comprising catalyst and contacting the feed with a hydrogen containing stream in the pre-reactor zone such that at least some of the carbon carbon double bonds are saturated, wherein the at least partial carbon double bond saturation occurs in a liquid phase in the pre-reactor zone; and
- (b) vaporising the at least partly saturated feed into the hydrogen containing stream in a vaporising zone.

Sutton et al. disclose vaporizing a feed stream and supplying the vaporized feed stream to a reaction zone comprising a catalyst and under conditions to allow hydrogenation and dehydration. For example, in the process illustrated in Fig. 2, Sutton et al. disclose vaporizing a feed stream fed via line 19 in first vaporization zone 20, subjecting the vaporized stream to hydrogenation and dehydration in a first reaction zone 25 and vaporizing additional fresh feed fed via line 28 by and into the resulting intermediate reaction mixture in second vaporization zone 27.

At page 3 of the Office action, the Office asserts that the difference between the claimed process and the process of Sutton et al. is recycling a depleted hydrogen-containing stream to the pre-reactor zone. The Office contends that this step is equivalent to step (e) of claim 1 of the cited reference in which the intermediate product stream of step (d) is supplied to a subsequent reaction zone. Applicants respectfully submit that the disclosure in Sutton et al. is in fact deficient in several respects as compared to claim 1, as amended.

As noted in applicants' reply submitted August 7, 2008, and acknowledged in the outstanding Office action, Sutton et al. do not disclose vaporizing an at least partly saturated feed into a hydrogen containing stream as required in step (b) of claim 1. The feed streams subjected to vaporization in Sutton et al. are not partly saturated streams resulting from contact with hydrogen in the presence of a catalyst as called for in claim 1. Nowhere does Sutton et al. disclose the process of claim 1 including vaporizing an at least partly saturated feed into a hydrogen containing stream.

Furthermore, to expedite prosecution, claim 1 has been amended to incorporate the limitation of dependent claim 17. The Office contends that hydrogenation in the first reaction zone of Sutton et al. is functionally equivalent to the at least partial saturation in the pre-reactor zone required in claim 1. Even if the first reaction zone of Sutton et al. can be said to provide partial saturation as occurs in the pre-reactor zone of the claimed process, the cited reference does not disclose or suggest partial saturation in a liquid phase reaction as required in claim 1 as amended. Rather, in Sutton et al., at least a portion of the cycle gas and vaporized feed material from the first vaporization zone is supplied to the first reaction zone (i.e., the reaction in the first reaction zone occurs in the vapor phase). (See, for example, col. 7, line 43 and col. 10, lines 18-20 of Sutton et al.)

In view of the absence of these limitations from the disclosure in Sutton et al., it is respectfully submitted that the cited reference fails to establish a *prima facie* case of obviousness with respect to the invention as now claimed.

As previously noted by applicants, a goal of the claimed process is minimizing cycle gas requirements, which generally

requires operation at relatively high temperatures that can lead to increased by-product formation. Vaporization following liquid phase partial saturation of the feed material as required in the claimed process advantageously reduces the cycle gas requirements for vaporization, without requiring operation at relatively high temperatures that can lead to increased by-product formation. Moreover, vaporization of a partly saturated feed as required in the claimed process provides a reduction in adiabatic temperature rise across the main vapor phase reactor. In this manner, the instantly claimed process allows for an increase in cycle gas loading without an unacceptable increase in temperature across the reactor. Thus, the process of the claimed invention provides a method for addressing the often competing concerns of cycle gas requirements, by-product formation, and process efficiency. Nowhere does the cited reference disclose or suggest the solution of preparing an at least partly saturated feed in a liquid phase in a pre-reactor zone.

In view of the above, applicants respectfully submit that claims 1-16 and 19-23 are not obvious in view of the disclosure of Sutton et al.

Rejection of Claims 1-17 and 19-23 under the Doctrine of Nonstatutory Obviousness-type Double Patenting

As set forth above, applicants respectfully submit that the pending claims are patentable over the disclosure of Sutton et al. More particularly, the pending claims include limitations (e.g., forming an at least partly saturated feed stream in a liquid phase in a pre-reactor zone) neither disclosed by Sutton et al. nor set forth in the claims of U.S. Patent No. 6,936,727. Accordingly, applicants respectfully request withdrawal of the

rejection of claims 1-17 and 19-23 under the doctrine of nonstatutory obviousness-type double patenting in view of claims 1-15 of Sutton et al.

Reconsideration and allowance of all pending claims are respectfully requested.

Should any issues remain unresolved after consideration of these remarks, applicants request that the Examiner contact the undersigned attorney prior to issuance of a further Office action.

Applicants do not believe that a fee is required for the filing of this response, as it is being submitted within the three month shortened statutory period for reply. In the event that fees are required, the Commissioner is hereby authorized to charge the necessary fee to Deposit Account No. 19-1345.

Respectfully submitted,

/Andrew C. Wegman/

Andrew C. Wegman, Reg. No. 54,530
SENNIGER POWERS LLP
100 North Broadway, 17th Floor
St. Louis, Missouri 63102
(314) 231-5400

VMK/ACW/sxm